LDWSF
41.8.2
3-20-15

Meeting Agenda - Jorgensen Forge Outfall Site

When: Thursday March 20, 2015; 10:00 am (60 minutes)

Where: EPA Office

Draft Agenda Items:

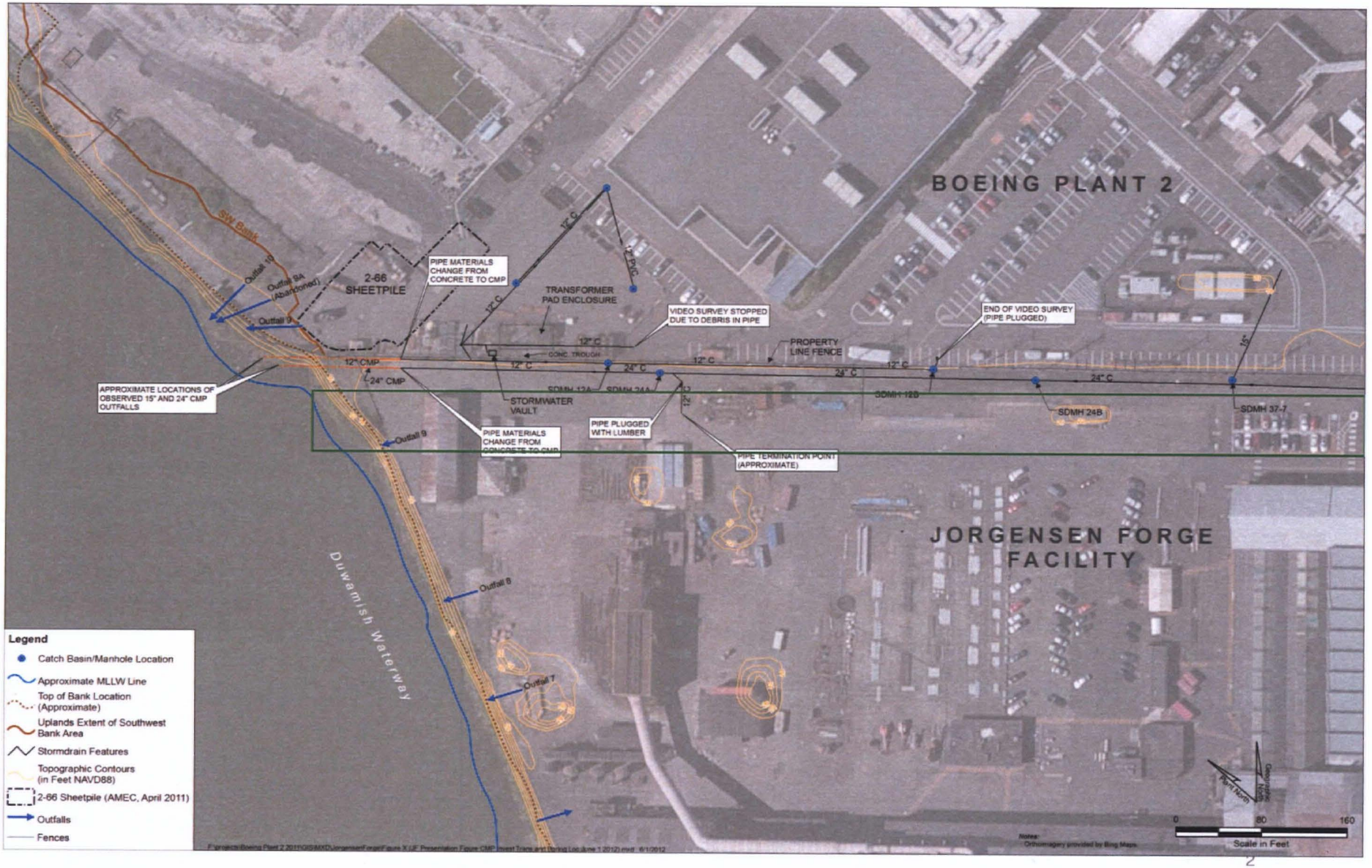
1) Introductions & meeting objectives (5 minutes)
2) JFOS Project orientation to EMJ Project (10 minutes)
    a. EMJ unknowns limit JFOS design process
        i. DMU5 Z-layer and backfill contamination residual (13 ppm)
    b. EMJ final grades
        i. MHHW (top-of-bank) no longer a JFOS issue with sheetpile left in place
        ii. JFOS design can accommodate any EMJ slope by wing wall
    c. Other issues
3) Cleanup level (20 minutes)
    a. 25 ppm TSCA low-occupancy level is not necessarily suitable for JFOS
    b. 10 ppm MTCA Industrial is most appropriate given the setting and situation
        i. DMU5 residuals
        ii. Jorgensen Forge/Plant 2 are Industrial, T-117 is Public
        iii. JFC/Boeing decision criteria apply for future Restrictive Covenants
        iv. Upland Sheetpile Cofferdam remains in place
    c. 1 ppm MTCA Unrestricted – rationale is contrary to multiple issues (see above)
        i. Why <u>shouldn't</u> it be set at 10 ppm or 25 ppm?
        ii. If 1 ppm, confirmed extent to 32bgs or likely drawdown outlier at 42bgs
4) Scope and design questions (10 minutes)
    a. Possible "in-the-wet" excavation approaches
    b. Fluff layer removal sequence options
    c. Ecology concurrence in writing
5) Schedule (10 minutes)
    a. Action Memo followed by Agreed Order Modification
    b. Draft Work Plan submittal and final Work Plan approval
    c. Contract award and mobilization - dependant on the above
6) Next steps (5 minutes)

Jorgensen Forge Outfalls Site (JFOS)

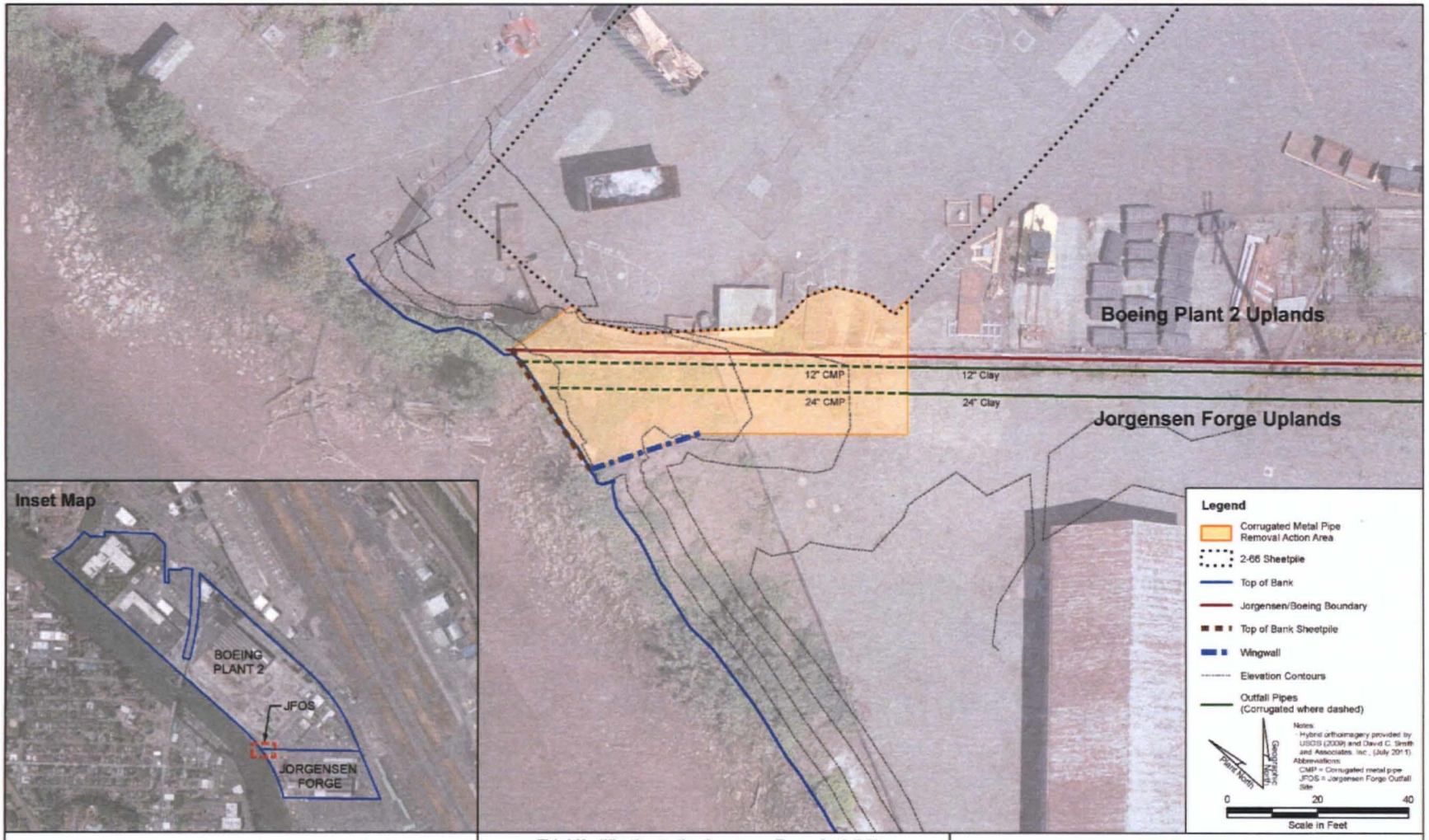
USEPA with Boeing and Jorgensen Forge
February 12, 2015

PRESENTATION MATERIALS FOR DISCUSSION PURPOSES ONLY

JFOS Site Location



Third Modification Figure – Submitted Draft



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Third Modification to the Jorgensen Forge Outfall Site
Administrative Order On Consent
Jorgensen Forge Outfall Site
Seattle/Tukwila, Washington

Figure 1
Site Features

I:\GIS\Projects\BOE_PL2MXDJFOS\Figure 1 (Site Features).mxd
12/3/2014

DRAFT FOR DISCUSSION PURPOSES

JFOS Order Status

- AOC Signed on 12/1/10
  - Field Work conducted Jan- Mar 2011
    - Clay pipes cleaned/sealed from East Marginal to Transition to Corrugated Metal Pipes (CMP)
    - Initial Geoprobe soil and groundwater Study around CMP
  - Completion Report approved by EPA July 2011
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  - Sheetpile Cofferdam designed and installed in February 2014
  - EMJ dredges out PCB-impacted sediment and backfills in mid August 2014
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  - Supplemental Completion Report submitted October 2014

Nature & Extent of Contamination in CMP Segment Area

- Corrosion and holes in CMP sections indentified in 2005 video survey
- Significant (> 50 ppm) PCB contamination beneath pipes
  - Beginning at the end of the clay pipe and extending toward waterway
  - Distinct "hot spots" beneath the 12-inch and 24-inch CM pipes.
- PCBs > 1 ppm found as deep as 32 feet bgs
- All samples between 32 feet to 40 feet < 1ppm
- One of two deep samples from 40-42 feet is ~2 ppm, attributed to drag down

Location of Sheetpile with respect to Waterway

- Existing segment along top of bank was installed above MHHW
- No work will occur below MHHW
- No work will occur south of the "wing wall"
- Therefore the third mod is considered uplands work.

MHHW for the Duwamish = 11.1 ft

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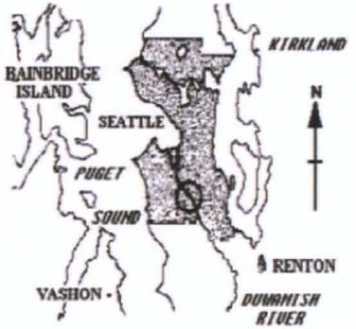
Location

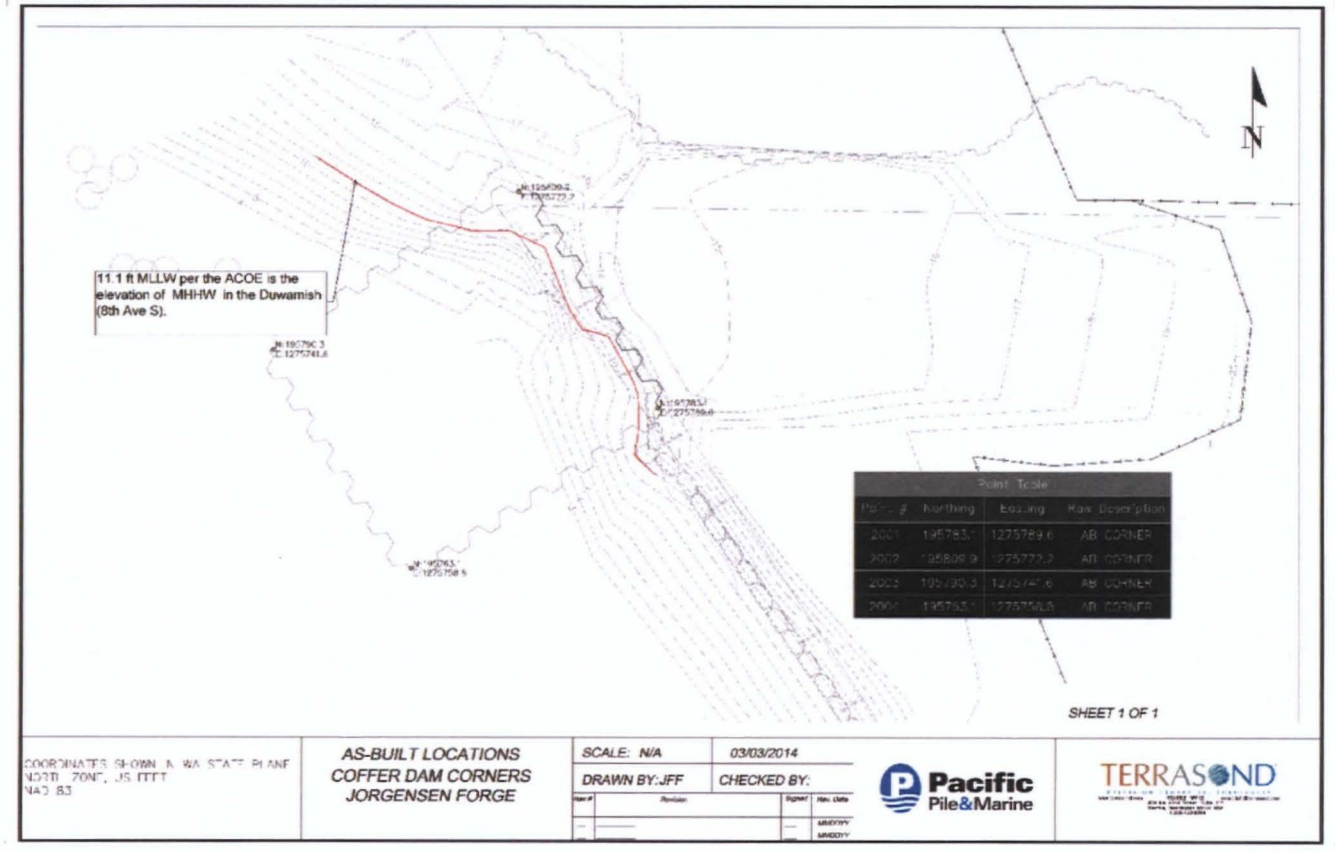


VICINITY MAP

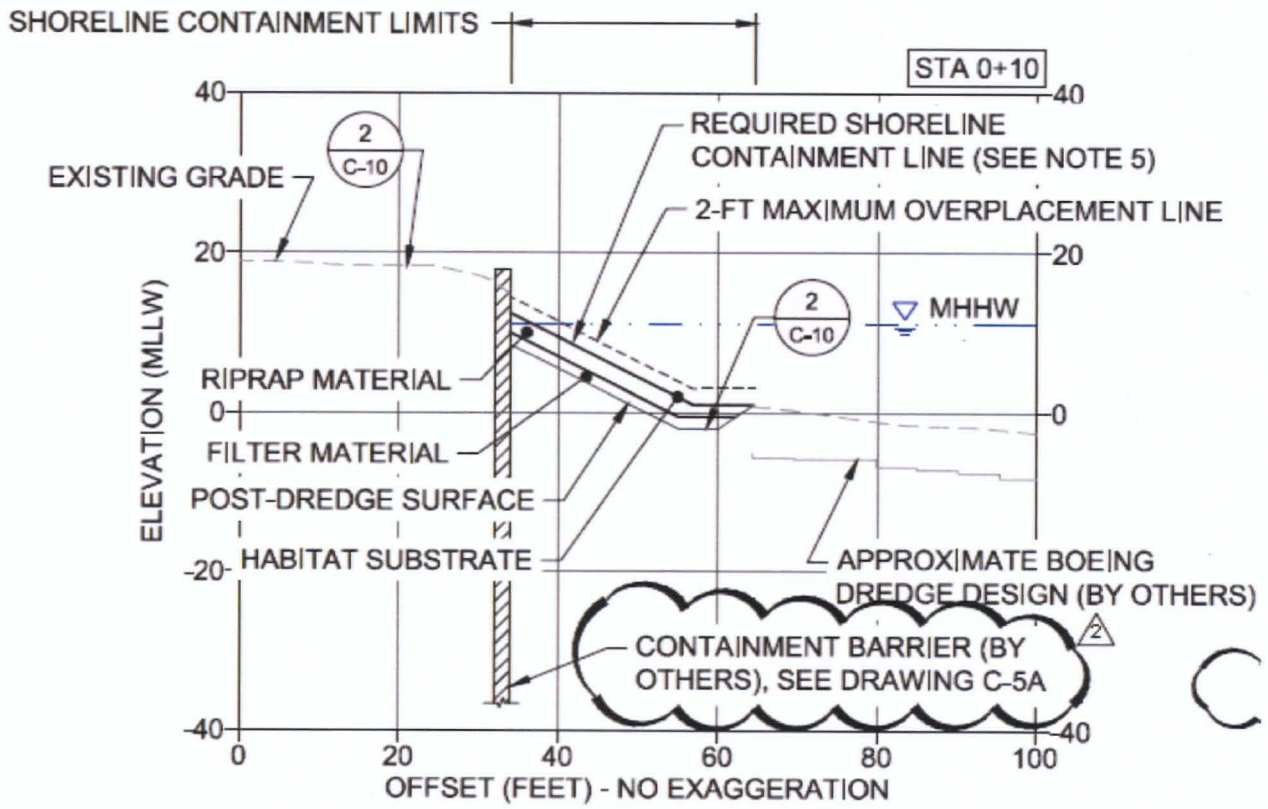
92 - Duwamish Waterway

Relation Between Various Datum Planes				
Datum Plane	MLLW	NGVD 29	NAVD 88	Corps of Engineers
Highest Estimated Tide	15.00 +/- 0.5			
Mean Higher High Water	11.10	5.10	8.68	
Mean High Water	10.24	4.24	7.82	
Mean (Half) Tide Level	6.50	0.50	4.08	
NGVD	6.00	0.00	3.58	
Mean Low Water	2.76	-3.24	0.34	
Mean Lower Low Water	0.00	-6.00	-2.42	
Lowest Estimated Tide	-4.50 +/- 0.5			
Record level (MLLW)				
Highest Observed Tide				
Date				
Lowest Observed Tide				
Date				
Period of Record				
Epoch	Jun 1, 1924 - Apr 30, 1925			
Index Gage				

Cofferdam As built

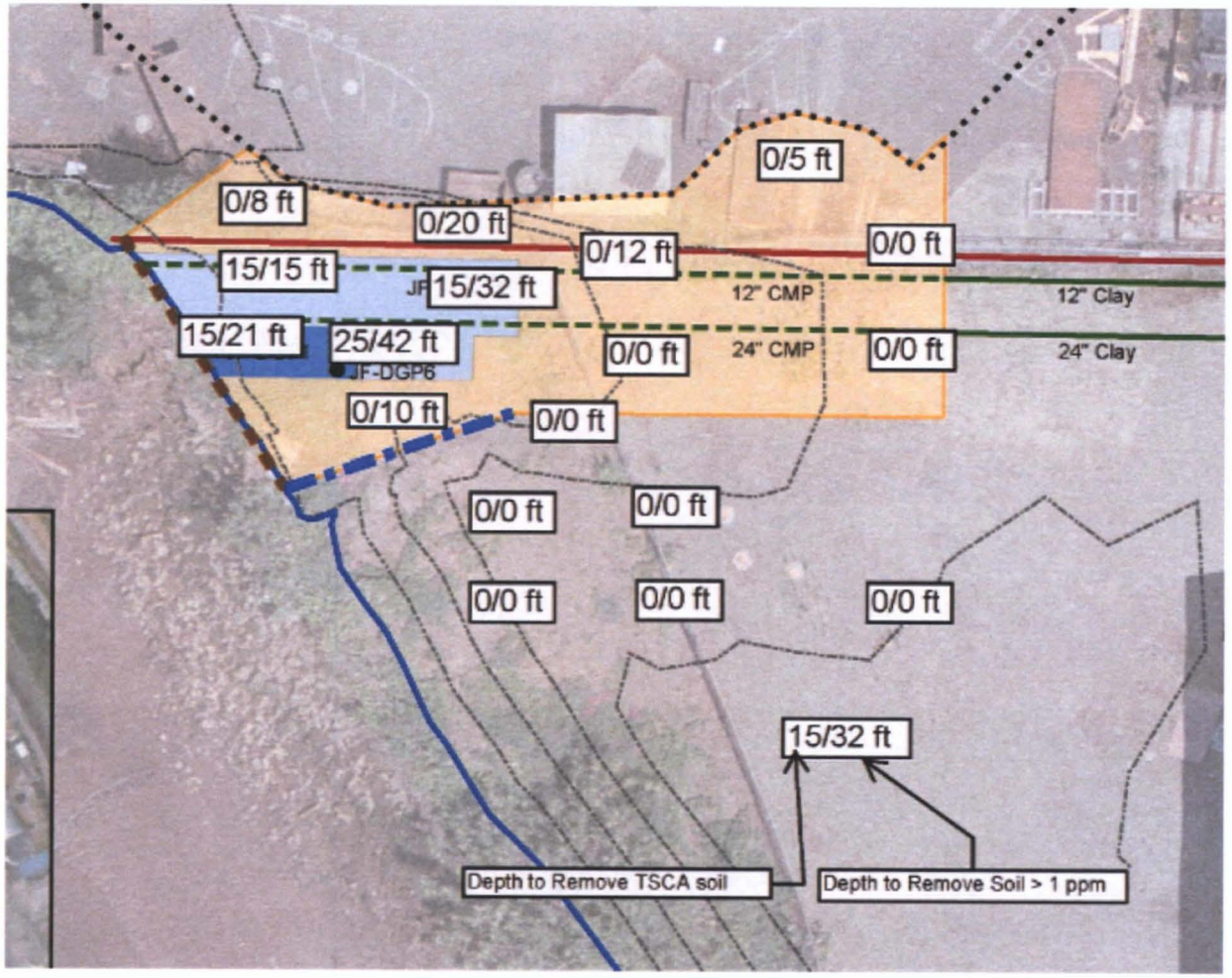


EMJ Plans - Backfill to MHHW



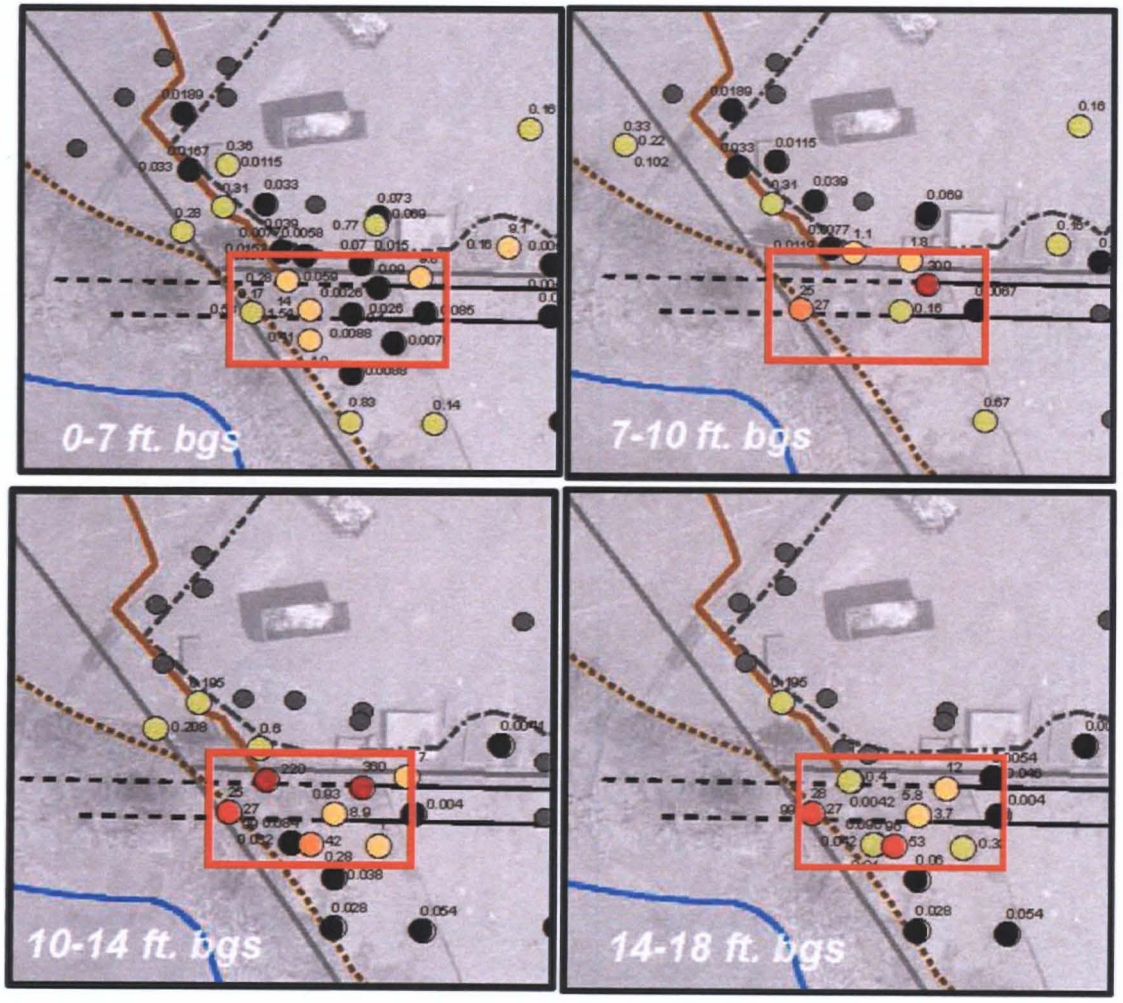
Current Condition following EMJ Backfill

Depth and Areal Extent of PCBs Relative to 50 ppm



Data boxes: maximum depth of PCBs >50 ppm / depth to reach 1 ppm

Results: Surface to 18 ft bgs (18 ft bgs = 0 MLLW)

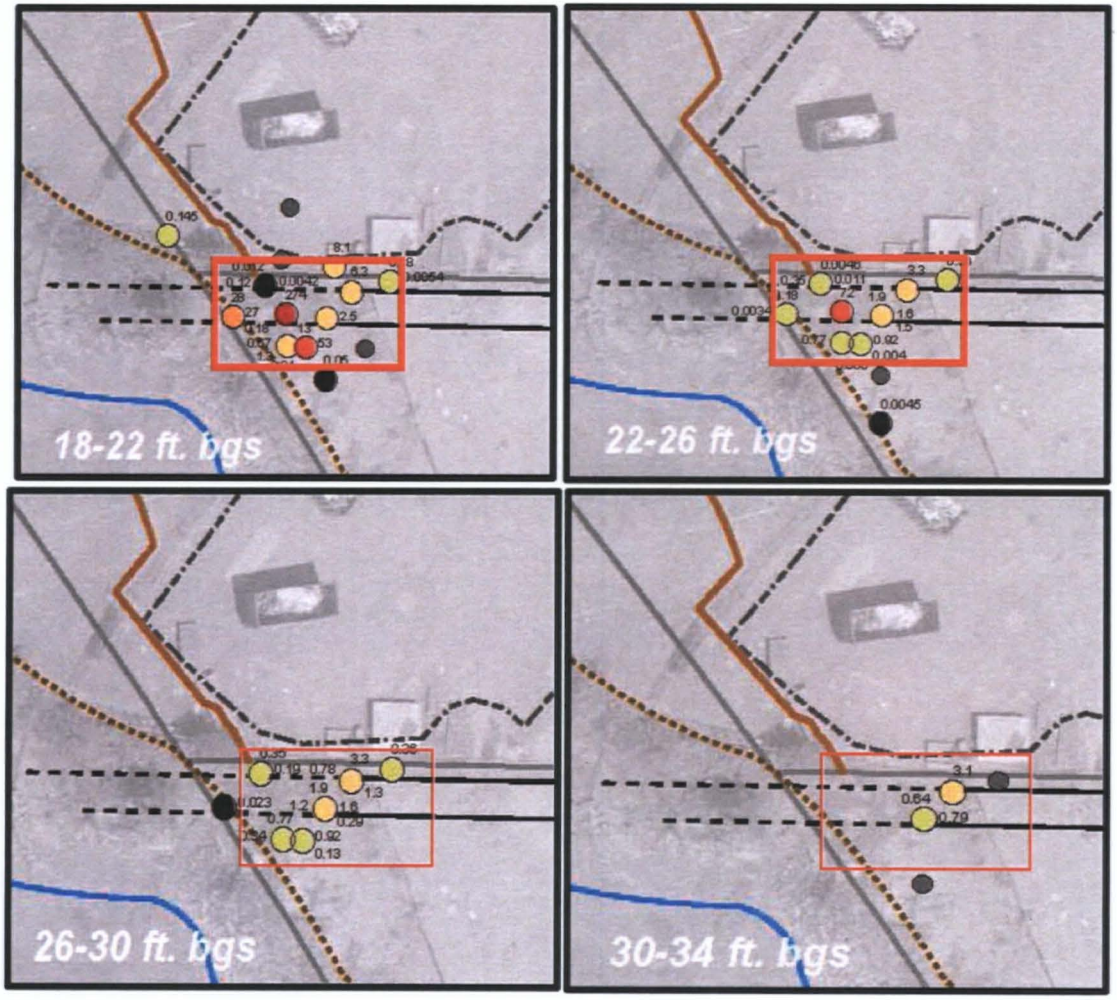


An approximately 2,000 square foot surface area

Total PCBs in soil in mg/kg (ppm)

- Non-Detect
- Detected < 0.130 ppm
- 0.130 to <1 ppm
- 1 to <25 ppm
- 25 to <50 ppm
- 50 to <150 ppm
- > 150 ppm

Results: 18 to 34 ft bgs

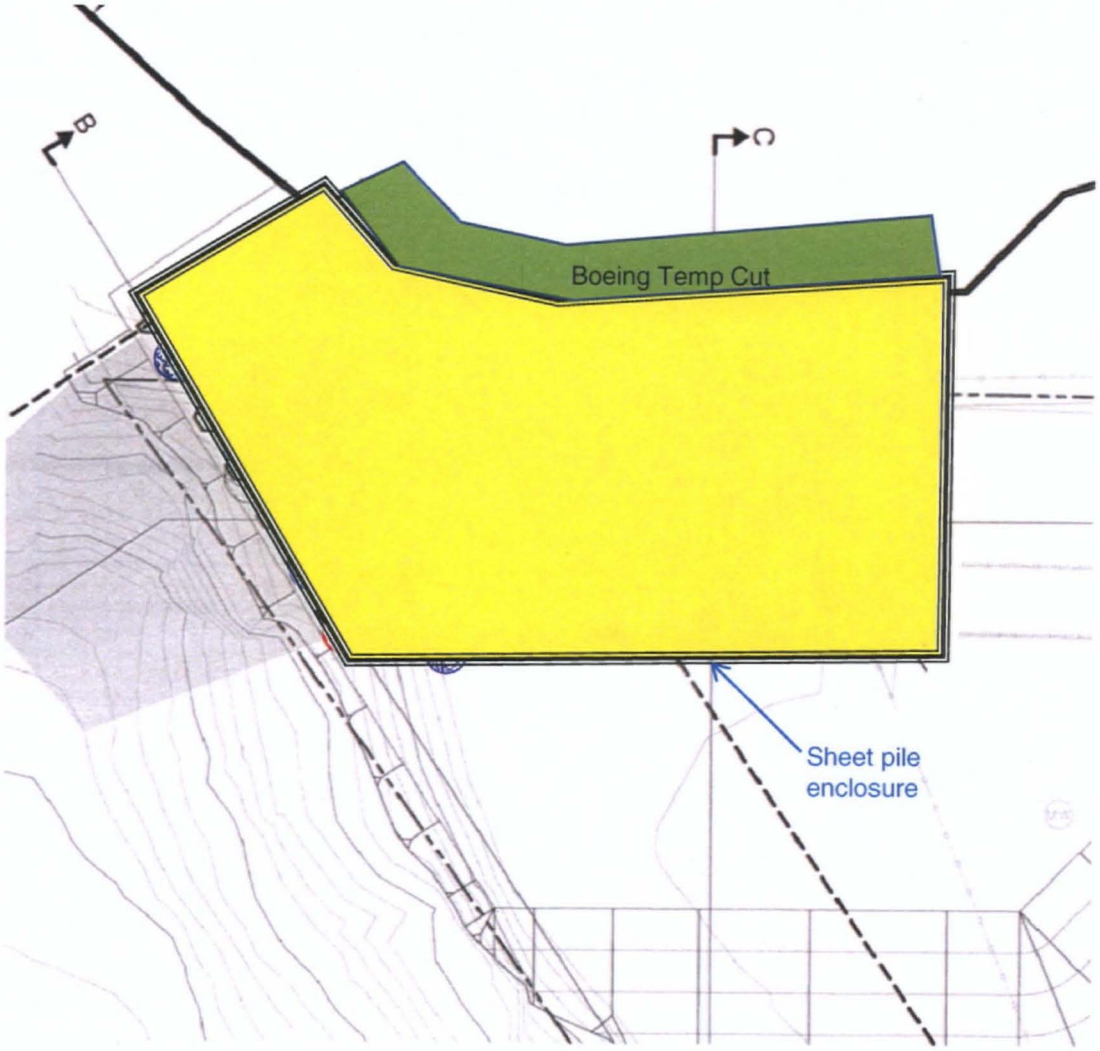


An approximately 2,000 square foot cleanup box.

Total PCBs in soil in mg/kg (ppm)

- Non-Detect
- Detected < 0.130 ppm
- 0.130 to <1 ppm
- 1 to <25 ppm
- 25 to <50 ppm
- 50 to <150 ppm
- > 150 ppm

Unbraced Sheet Pile Shoring & Excavation in the Wet



- Drive Sheets on perimeter up to face of Boeing 2-66 wall
- Bench cut optional on JF property but temporary 6 to 7 foot cut required on Boeing property for safety of 2-66 wall
- No internal bracing or dewatering
- Water added to cofferdam to avoid need for bracing when excavating below El. 12
- Excavate in wet to target elevations
- Stage and stabilize excavation spoil for off site disposal
- Confirmation sampling at base of excavation
- Flocculation required for expedited settlement of suspended sediments
- Backfill with Sand & Gravel
- Treat water displaced by backfilling
- Pull Sheets
- All spoil removed below El. 12 likely TSCA
- Limitations of construction will likely result in "fluff" layer at base of excavation with residual PCBs

EPA's concern about seepage is unclear

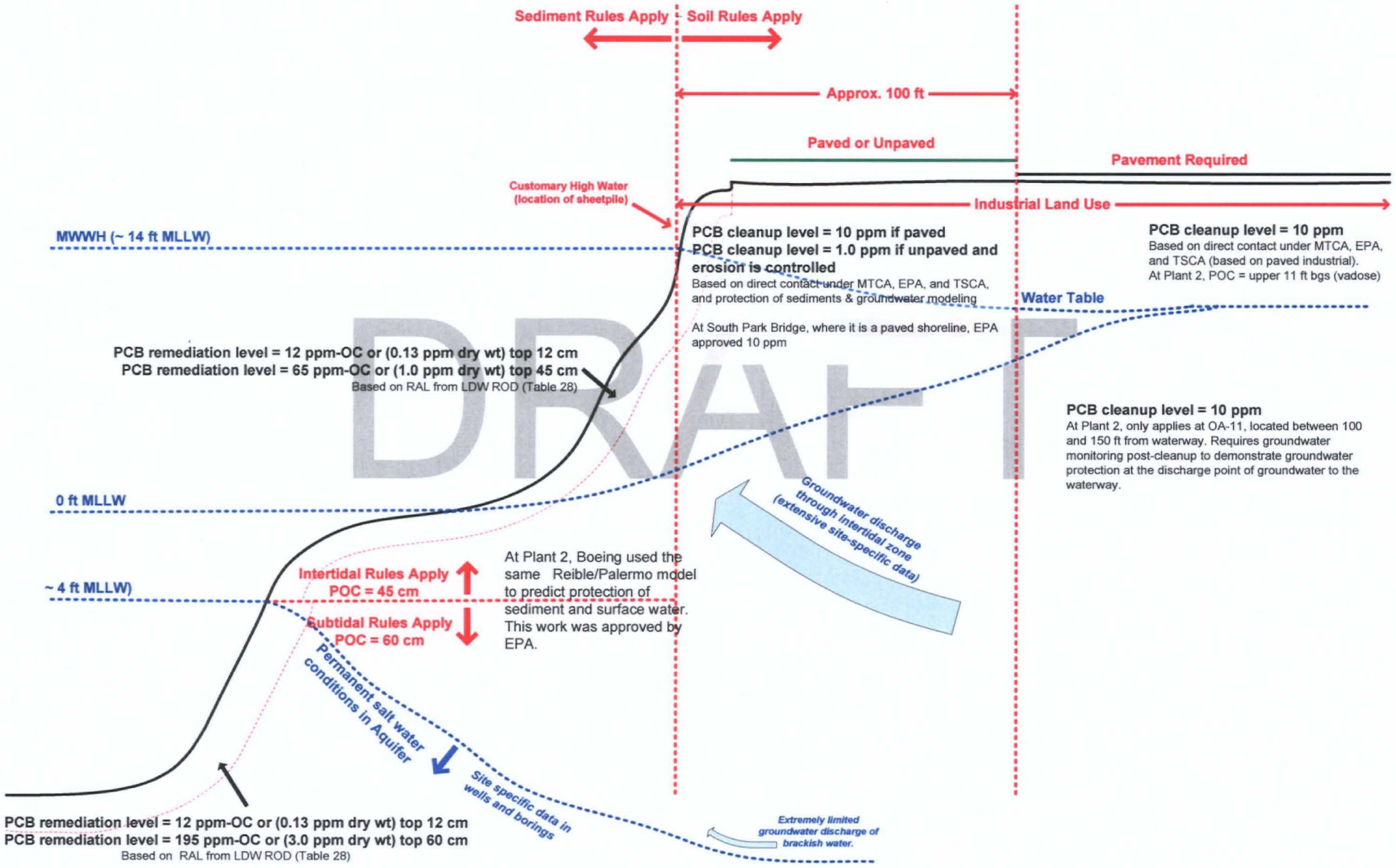
Draft Schedule

JORGENSON FORGE OUTFALLS 3RD MOD
SCHEDULE THROUGH THE END OF CONSTRUCTION
Version 2/6/2015

ACTIVITY	Duration in Weeks	2/9	2/16	2/23	3/2	3/9	3/16	3/23	3/30	4/6	4/13	4/20	4/27	5/4	5/11	5/18	5/25	6/1	6/8	6/15	6/22	6/29	7/6	7/13	7/20	7/27	8/3	8/10	8/17	8/24
Order Signed	4			>>>>																										
Initial planning	4	>>>>	>>>>	>>>>	>>>>																									
EPA Action Memo Rec'd					X																									
Work Plan Preparation	4					>>>>	>>>>																							
Draft EPA Workplan Submittal	0							X																						
EPA Draft Workplan Comments	4							>>>>	>>>>	>>>>	>>>>																			
Response to EPA Draft Comments	2										>>>>	>>>>																		
EPA Draft Final Work Plan Comments	4												>>>>	>>>>																
Work Plan Approved	0														X															
Bid Document Preparation	6												>>>>	>>>>	>>>>	>>>>	>>>>	>>>>												
Call for Bids	0																		X											
Contractor Bid Process	2																		>>>>	>>>>										
Contractor Selection	1																				>>>>									
Contract in Place	0																					X								
Mobilization	2																					>>>>	>>>>							
Construction	4																							>>>>	>>>>	>>>>	>>>>			
Cleanup & Demobe	2																											>>>>	>>>>	

Assumptions

1. No Bond Required (pre-qualified bidders)
2. Private Bid Opening
3. No "Negotiations" (rip & read)
4. WS Dept of Ecology will not formally review
5. EPA will not review contractor submittals


Sediment Rules Apply
Soil Rules Apply
Approx. 100 ft
Paved or Unpaved
Pavement Required
Customary High Water (location of sheetpile)
Industrial Land Use
MWWH (~ 14 ft MLLW)
PCB cleanup level = 10 ppm if paved
PCB cleanup level = 1.0 ppm if unpaved and erosion is controlled
Based on direct contact under MTCA, EPA, and TSCA, and protection of sediments & groundwater modeling
At South Park Bridge, where it is a paved shoreline, EPA approved 10 ppm
PCB cleanup level = 10 ppm
Based on direct contact under MTCA, EPA, and TSCA (based on paved industrial).
At Plant 2, POC = upper 11 ft bgs (vadose)
Water Table
PCB remediation level = 12 ppm-OC or (0.13 ppm dry wt) top 12 cm
PCB remediation level = 65 ppm-OC or (1.0 ppm dry wt) top 45 cm
Based on RAL from LDW ROD (Table 28)
DRAFT
PCB cleanup level = 10 ppm
At Plant 2, only applies at OA-11, located between 100 and 150 ft from waterway. Requires groundwater monitoring post-cleanup to demonstrate groundwater protection at the discharge point of groundwater to the waterway.
0 ft MLLW
Groundwater discharge through intertidal zone (extensive site-specific data)
~ 4 ft MLLW)
Intertidal Rules Apply
POC = 45 cm
Subtidal Rules Apply
POC = 60 cm
At Plant 2, Boeing used the same Reible/Palermo model to predict protection of sediment and surface water. This work was approved by EPA.
Permanent salt water conditions in Aquifer
Site specific data in wells and borings
Extremely limited groundwater discharge of brackish water.
PCB remediation level = 12 ppm-OC or (0.13 ppm dry wt) top 12 cm
PCB remediation level = 195 ppm-OC or (3.0 ppm dry wt) top 60 cm
Based on RAL from LDW ROD (Table 28)

Meeting Agenda

Jorgensen Forge Outfall Site

JFOS Order Third Modification - Remedial Options Review

When: Wednesday January 14, 2015; 10:00 – 12:00

Where: Floyd|Snider office, 6th Floor, Two Union Square

Invitees: Ravi Sanga, Dave Bartus & Melissa Blankenship, USEPA
Will Ernst, Boeing
Miles Dyer, Jorgensen Forge (JFC)
Dee Gardner, SoundEarth Strategies
Tom Colligan, Floyd|Snider

Draft Agenda Items:

1) Meeting objectives (5 minutes)
2) Second Modification to the JFOS Order (5 minutes)
    a. Status - Removal Action Supplemental Completion Report
    b. Close out of Second Modification Removal Action
3) Third Modification to the JFOS Order (10 minutes)
    a. Draft proposed by JFC/Boeing on December 5, 2014
    b. Process and schedule to finalize and circulate for signatures
4) Third Modification - Removal Action Discussion (90 minutes)
    a. Site conceptual model and supporting data
    b. Remedial approaches being considered
    c. EPA guidance on key decision factors
        i. Soil segregation - TSCA (Subtitle C) versus Non-TSCA (Subtitle D)
        ii. Configuration of required excavation depth & confirmational sampling
        iii. Decontamination
5) Next Steps and Schedule (10 minutes)

Jorgensen Forge Outfalls Site (JFOS)

USEPA with Boeing and Jorgensen Forge

January 14, 2015

PRESENTATION MATERIALS FOR DISCUSSION PURPOSES ONLY

JFOS Site Location

JFOS Order Status

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  - Field Work conducted Jan- Mar 2011
    - Clay pipes cleaned/sealed from East Marginal to Transition to Corrugated Metal Pipes (CMP)
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Initial AOC Work

Goal: Address high levels of contamination in the Outfall pipes

- Seal upstream end of 24-inch clay pipe.
- Remove accumulated solids and jet clean interior of pipes, laterals, and manholes.
- Seal pipes at transition to CMP to prevent tidal waters from entering.
- Video pipes for all connections/laterals
- Sample solids within the 12-inch and 24-inch pipes, manholes, and laterals.
- Geoprobe borings advanced along three transects perpendicular to shoreline
- Results:
  - PCBs >> 50 ppm found at depth in CMP area
  - Further investigation necessary

First Modification Work

Goal: Define Extent of PCBs > 1 ppm beneath CMP sections

1. 13 Geoprobe borings advanced, intensive sampling to 42' BGS
2. Soil samples collected mainly for PCBs, some VOC, SVOC and metals analysis
3. Logged soils and fill occurrence; transition to native soils noted
4. Fill included sand (possibly hydraulic fill), rock fill, and poor quality fill; visible contamination and sheens were noted

Second Modification Work

Goal: Define Extent of PCBs > 1 ppm under bank and install/remove sheetpile

1. 4 angle borings advanced under shoreline
2. Cofferdam installed to contain underbank contamination
3. Sheetpile removed/stored for subsequent use

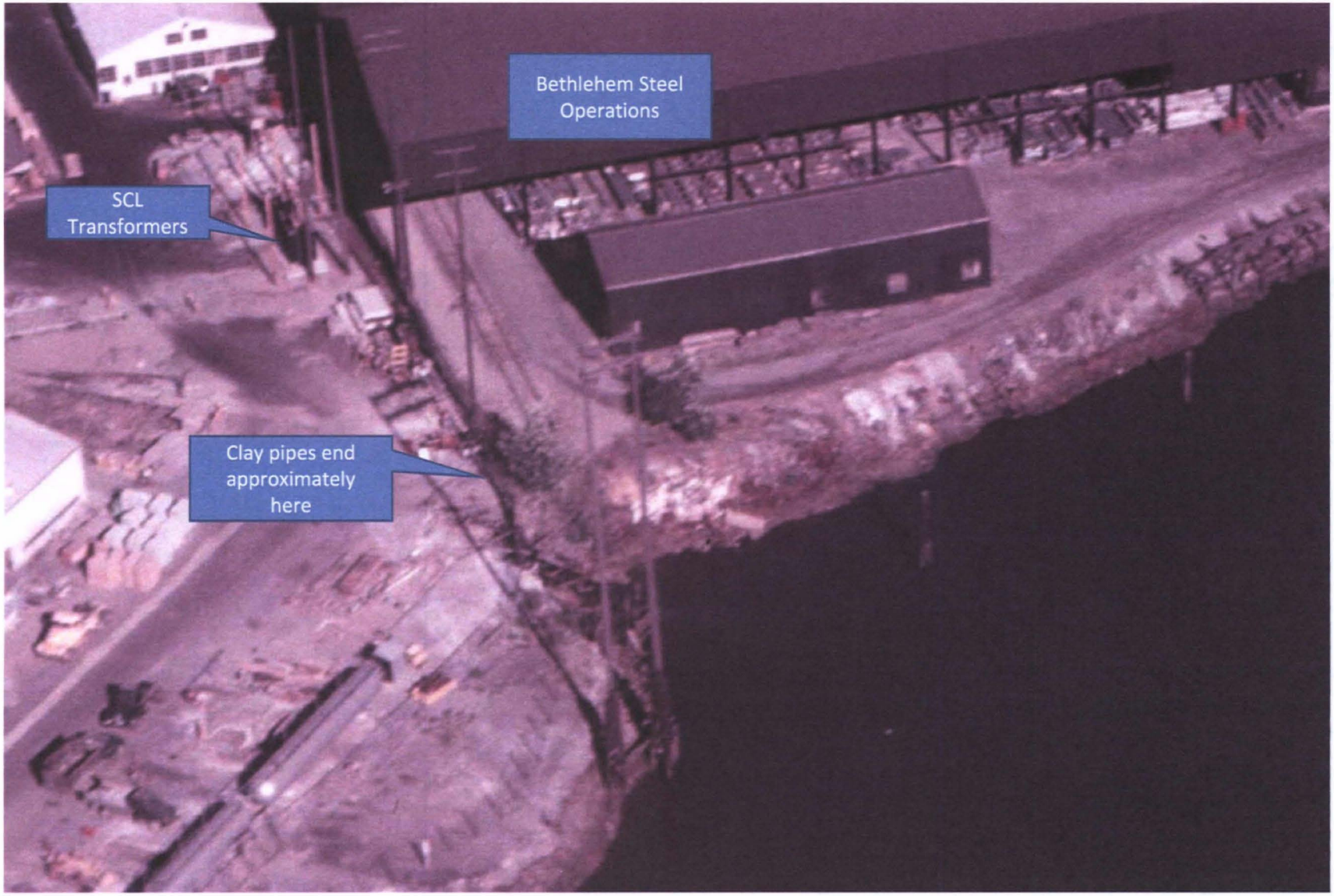
Conceptual Site Model

- Background and Outfall Area History
- Extent of Contamination
- Pathways of Exposure

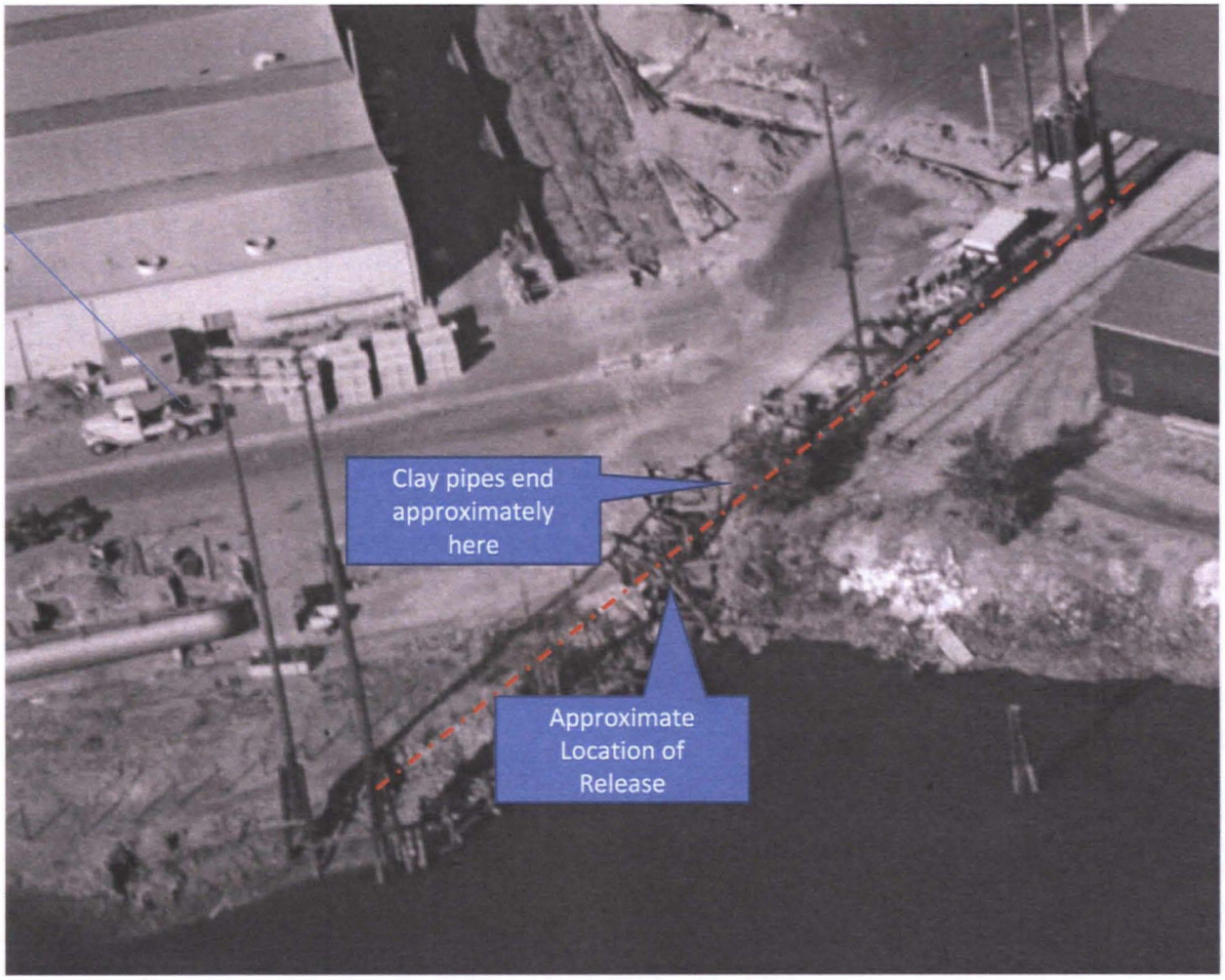
JFOS Shoreline with Plant 2 and Isaacson Steel – 1942

Plant 2 manufacturing of airplanes and Isaacson Steel manufacturing drive shafts for maritime vessels.

JFOS shoreline with Bethlehem Steel facility - 1953



JFOS Shoreline - 1953



Nature & Extent of Contamination in CMP Segment Area

- Corrosion and holes in CMP sections indentified in 2005 video survey
- Significant (> 50 ppm) PCB contamination beneath pipes
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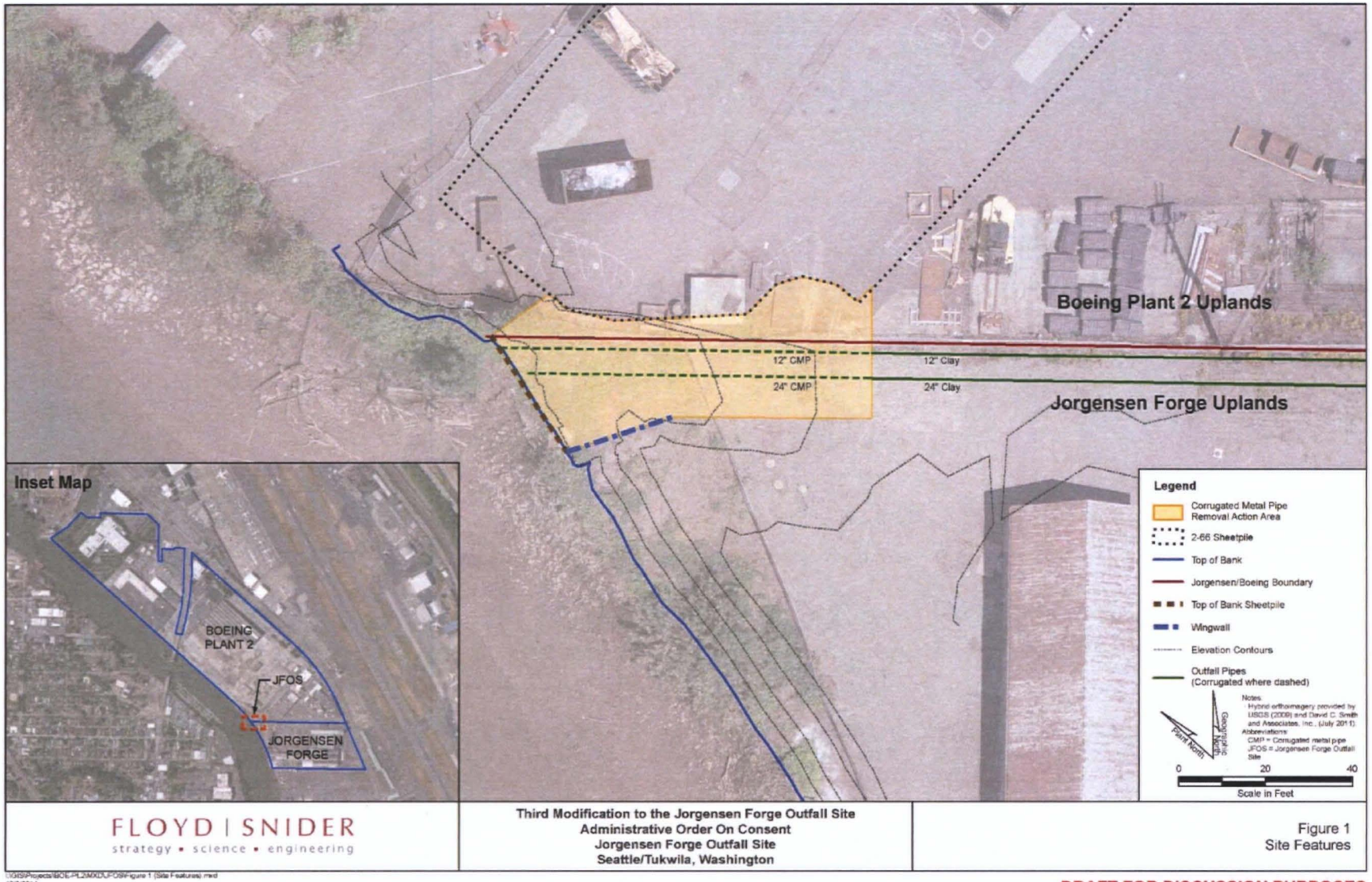
Third Modification Figure – Submitted Draft



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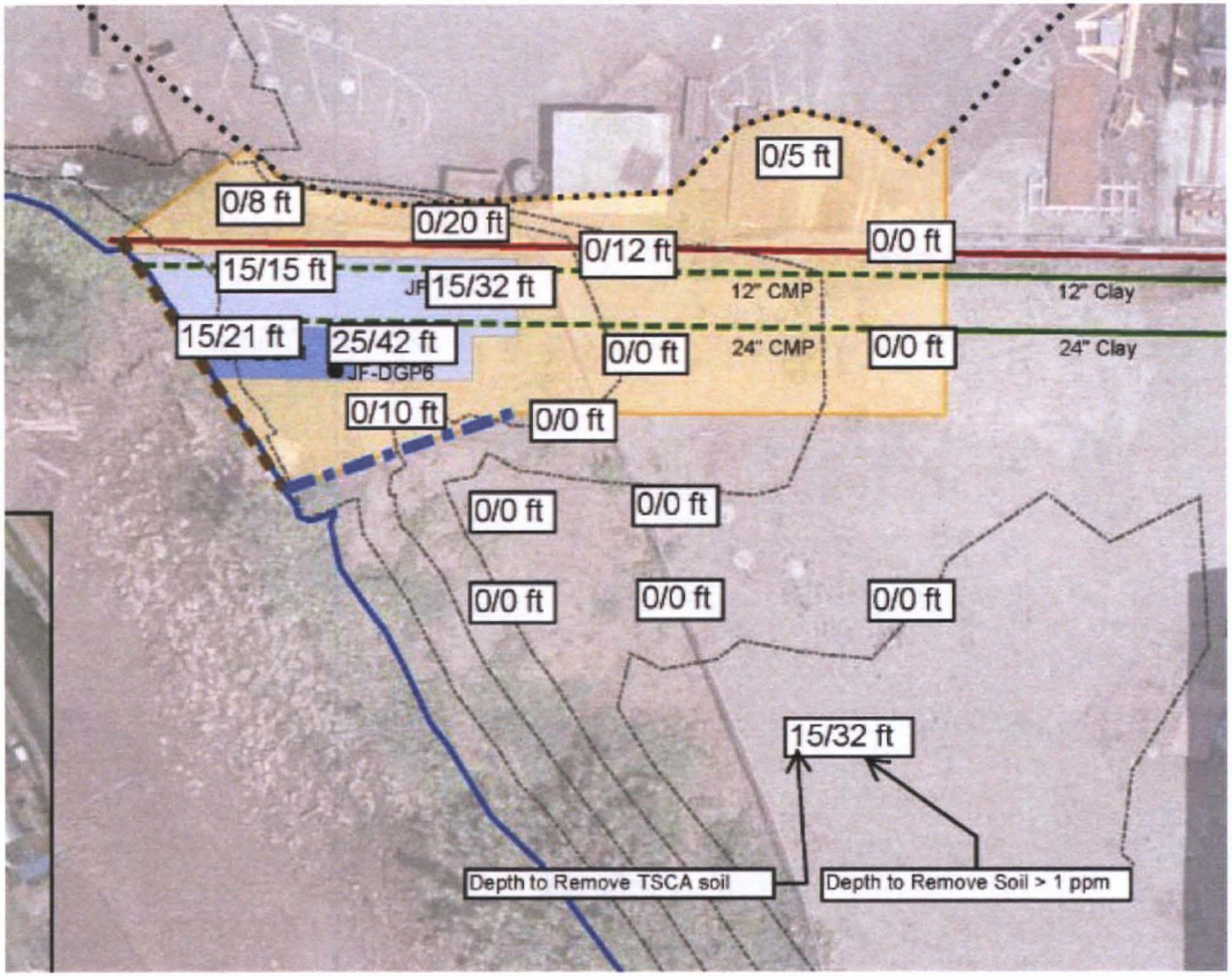
Third Modification to the Jorgensen Forge Outfall Site
Administrative Order On Consent
Jorgensen Forge Outfall Site
Seattle/Tukwila, Washington

Figure 1
Site Features

I:\GIS\Projects\BOE-PL2\MXD\JFOS\Figure 1 (Site Features).mxd
12/3/2014

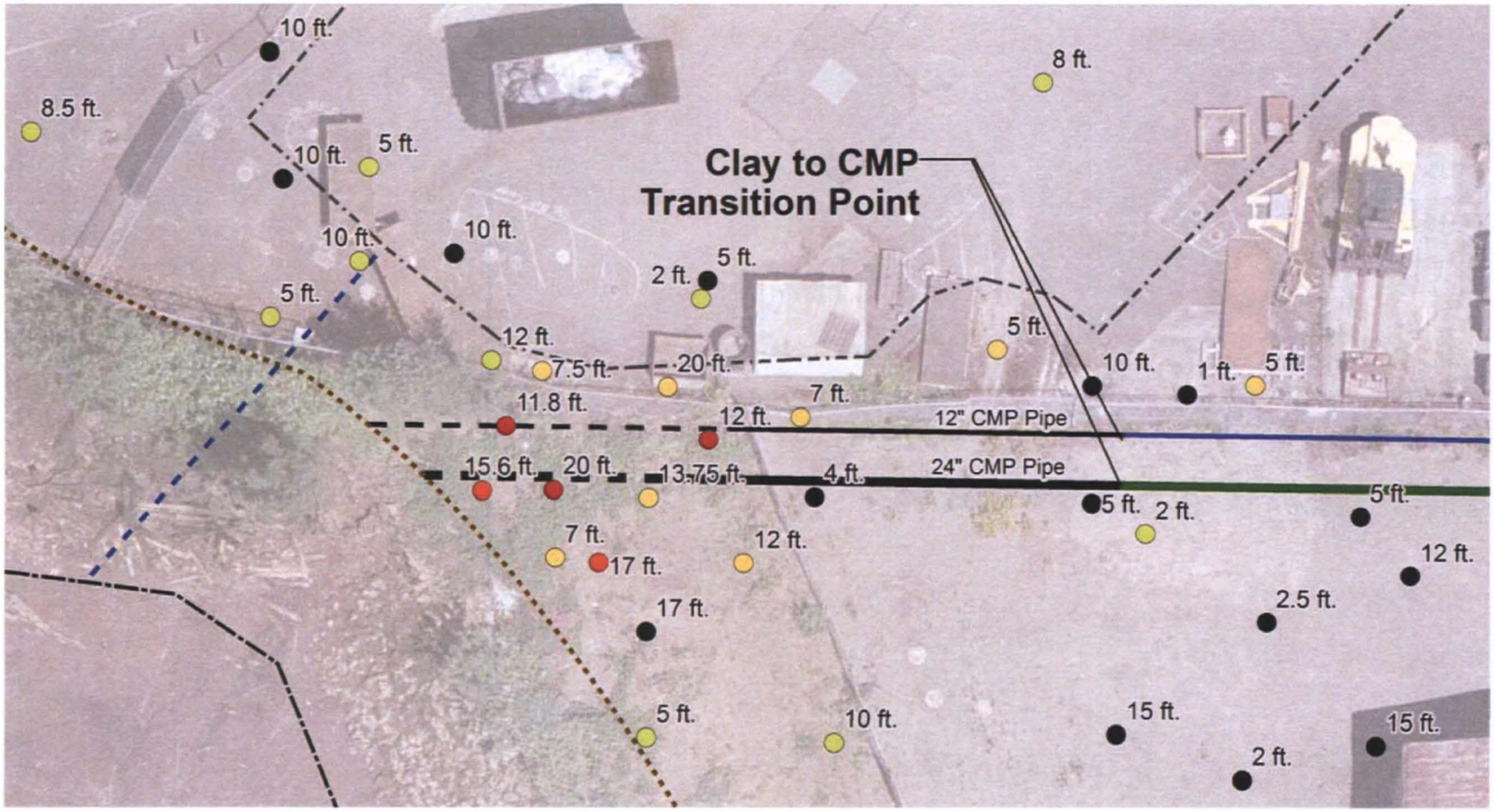
DRAFT FOR DISCUSSION PURPOSES

Depth and Areal Extent of PCBs Relative to 50 ppm

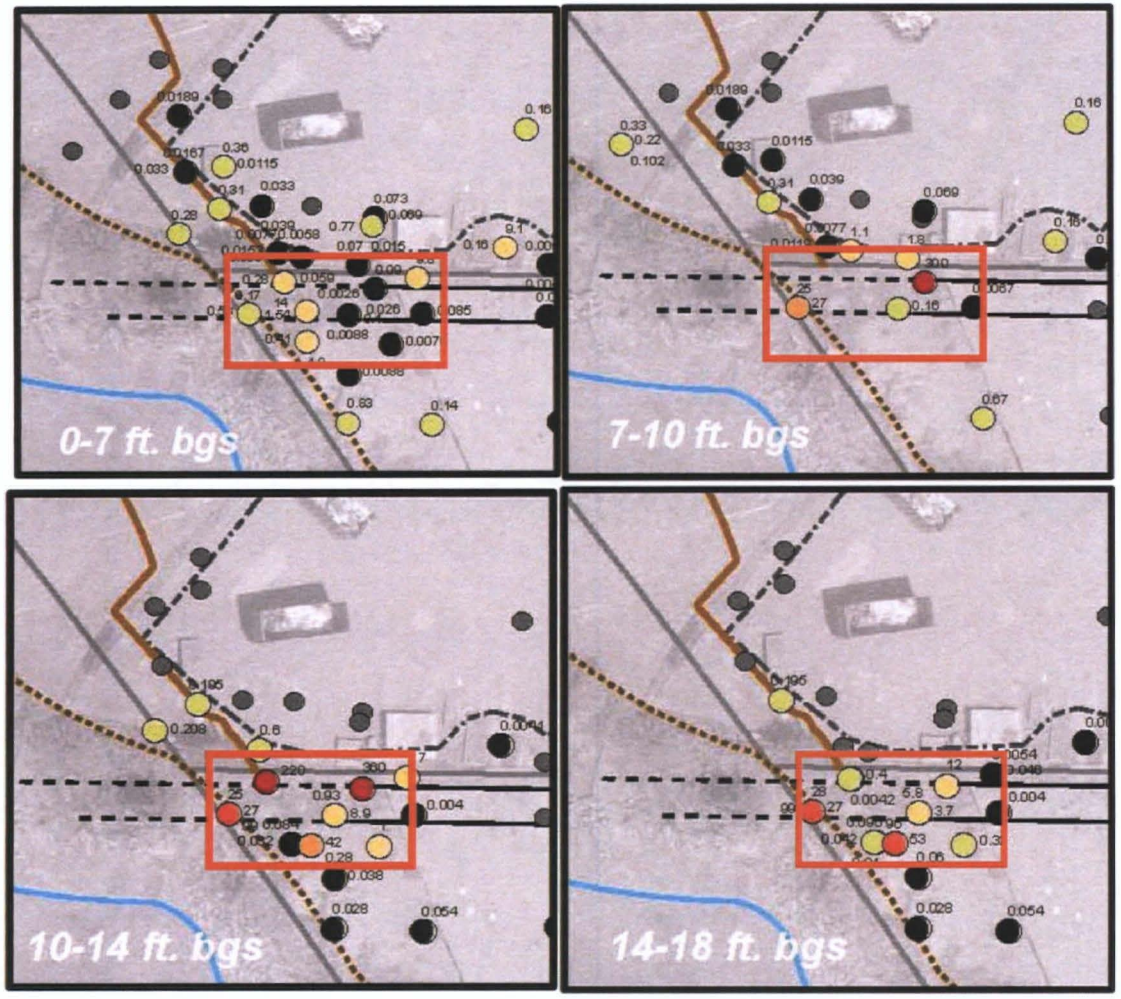


Data boxes: maximum depth of PCBs >50 ppm / depth to reach 1 ppm

Area Surrounding CMP has been Extensively Studied as Well



Results: Surface to 18 ft bgs (18 ft bgs = 0 MLLW)



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Human Health & Environment Risk Pathways

Assumptions:

- Risk to be managed is from soil deeper than 8 feet
  - Direct Contact Risk to Workers
  - Groundwater migration pathway
- Ecological Risk to Sediments and Waterway is addressed and not part of the Third Modification Scope

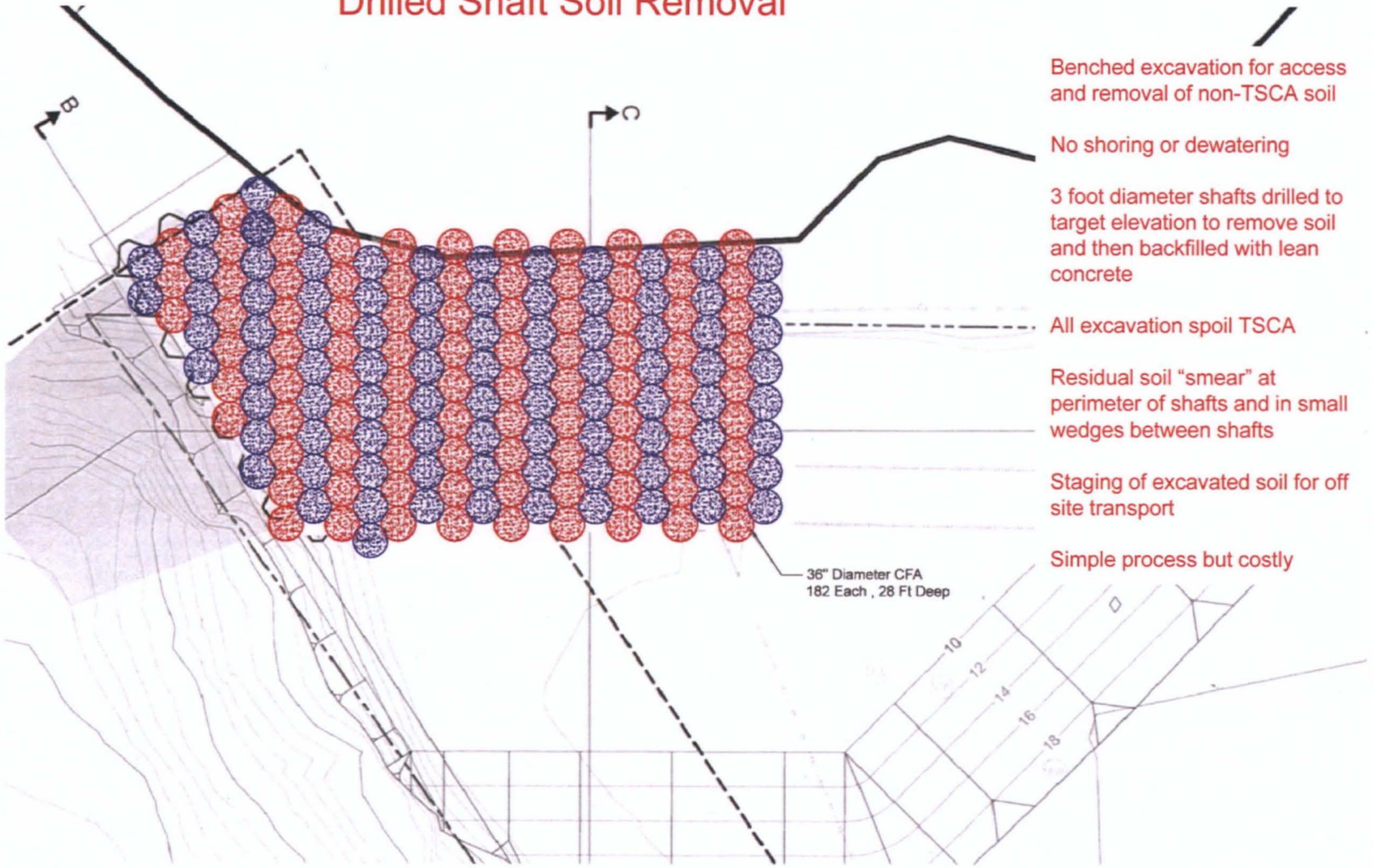
Objective and Assumption:

- Removal of PCBs >1 ppm (per TSCA rule and for MTCA Residential Cleanup Level) will address both pathways and, therefore, not require institutional controls

Remedial Options Considered - All achieve the goal

- Drilled Shafts - "Cookie Cutter" soil removal & replacement with lean concrete
- Slurry Trench – Soil removal & replacement with lean concrete
- Braced Sheet Pile Shoring & Excavation in the Dry
- **Unbraced Sheet Pile Shoring & Excavation in the Wet (Preferred)**

Drilled Shaft Soil Removal



Benched excavation for access and removal of non-TSCA soil

No shoring or dewatering

3 foot diameter shafts drilled to target elevation to remove soil and then backfilled with lean concrete

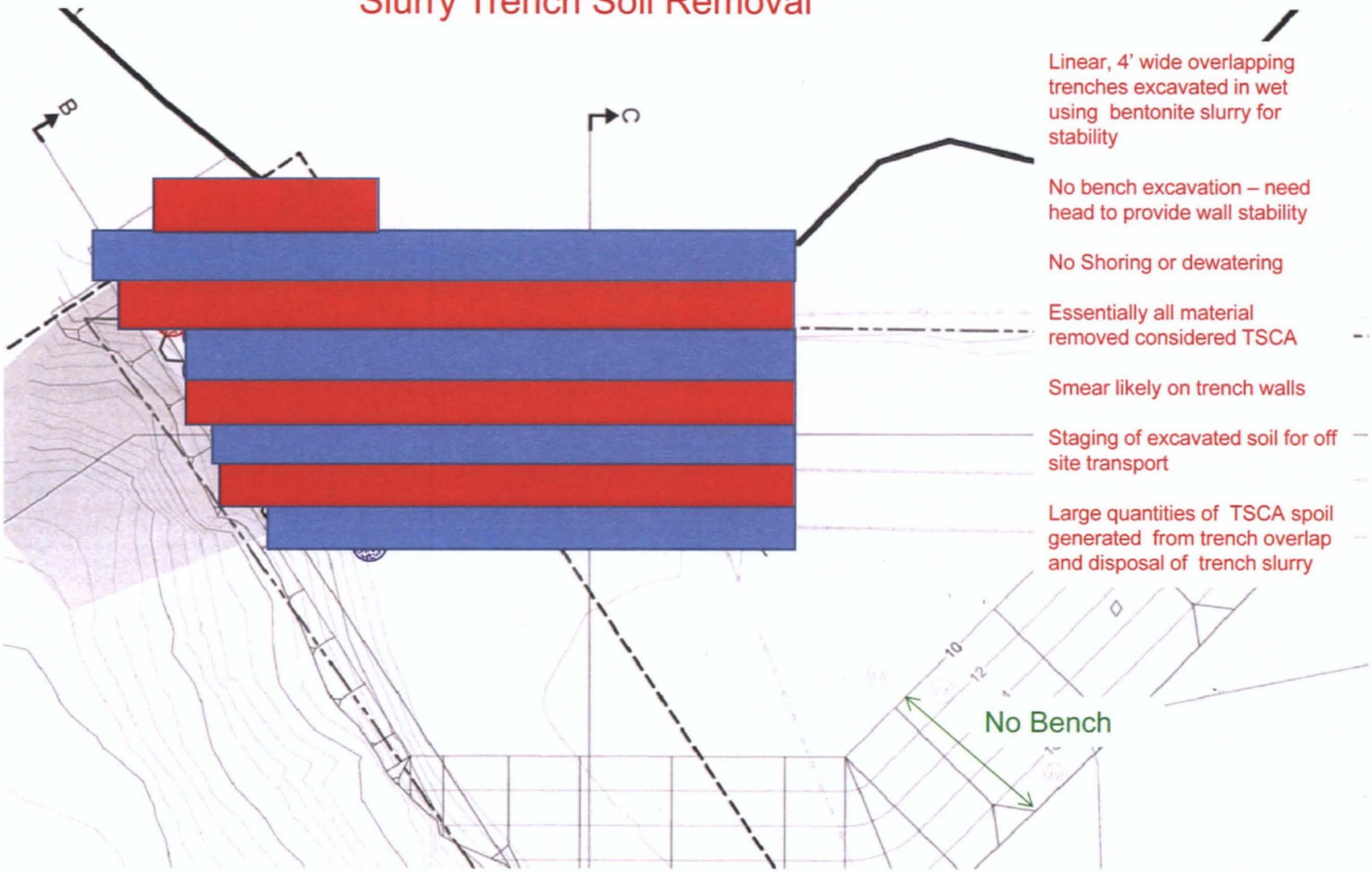
All excavation spoil TSCA

Residual soil "smear" at perimeter of shafts and in small wedges between shafts

Staging of excavated soil for off site transport

Simple process but costly

Slurry Trench Soil Removal



Linear, 4' wide overlapping trenches excavated in wet using bentonite slurry for stability

No bench excavation – need head to provide wall stability

No Shoring or dewatering

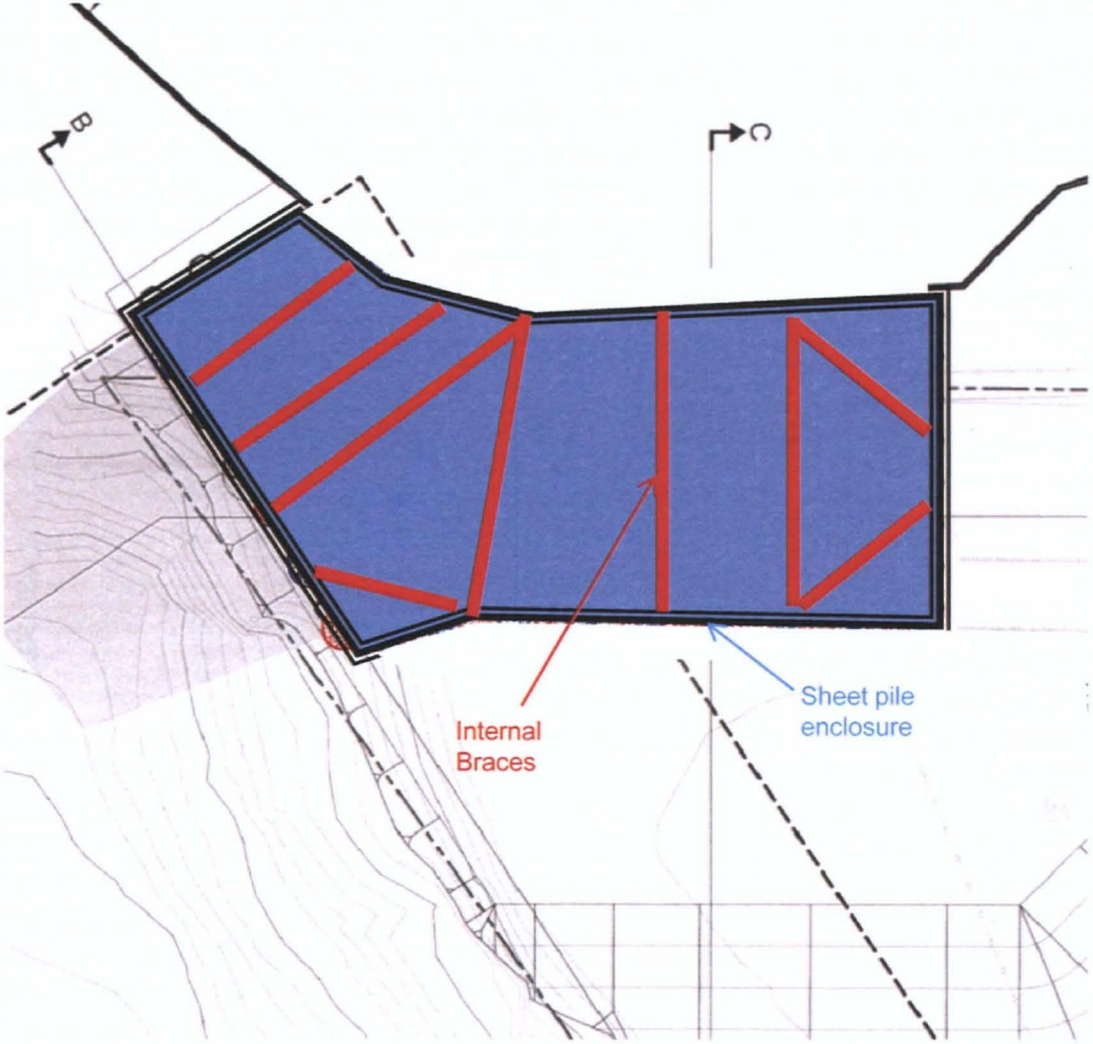
Essentially all material removed considered TSCA

Smear likely on trench walls

Staging of excavated soil for off site transport

Large quantities of TSCA spoil generated from trench overlap and disposal of trench slurry

Braced Sheet Pile Shoring & Excavation in the Dry



Bench cut non TSCA soil for access

Drive Sheets on perimeter to face of Boeing 2-66 wall

Install dewatering wells inside shoring

Excavate in 5 foot lifts and install internal bracing

Tedious less safe excavation in confined space with mini excavators to remove soil between braces

Confirmation sampling at base excavation

Backfill with Sand & Gravel and remove bracing

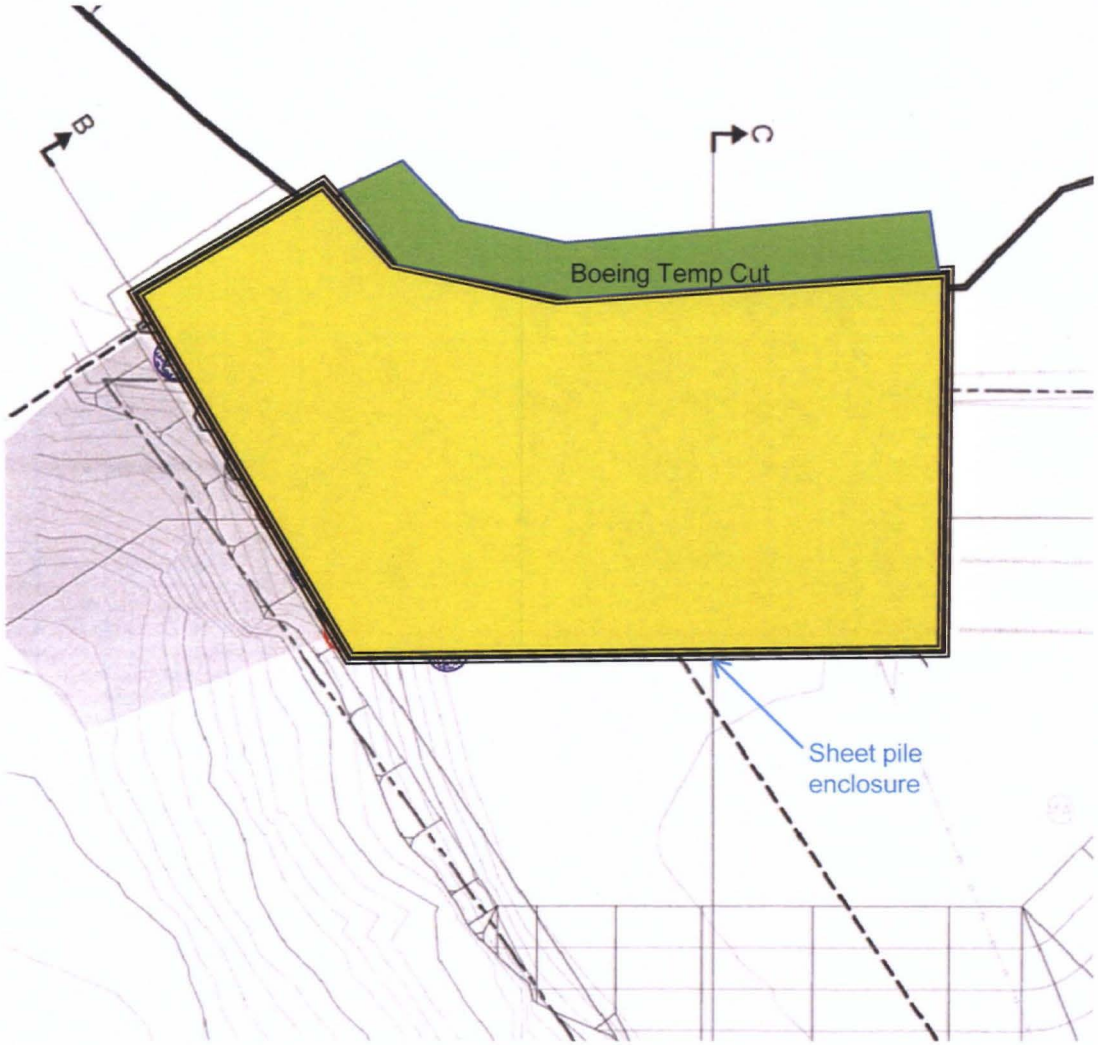
Pull Sheets

Expensive because of internal bracing and limited access for soil removal

Dewatering discharge must be treated

Complex construction likely to have increased risk of delays and cost over runs

Unbraced Sheet Pile Shoring & Excavation in the Wet - PREFERRED



Drive Sheets on perimeter up to face of Boeing 2-66 wall

Bench cut optional on JF property but temporary 6 to 7 foot cut required on Boeing property for safety of 2-66 wall

No internal bracing or dewatering

Water added to cofferdam to avoid need for bracing when excavating below El. 12

Excavate in wet to target elevations

Stage and stabilize excavation spoil for off site disposal

Confirmation sampling at base of excavation

Flocculation required for expedited settlement of suspended sediments

Backfill with Sand & Gravel

Treat water displaced by backfilling

Pull Sheets

All spoil removed below El. 12 likely TSCA

Limitations of construction will likely result in "fluff" layer at base of excavation with residual PCBs

Sheetpiled Excavation "In The Wet"

- Temporary sheetpile uplands cofferdam:
  - allows effective and more controlled excavation below water table
  - dampens or eliminates groundwater flow and tidal/river level fluctuations
  - fixes lateral excavation limits
  - uses and protects existing Boeing sheetpile
- Top of Bank sheetpiles already in place
- Sheets stacked on ground are sufficient to encompass CMP area

Questions for EPA to Guide Planning Process

- May we segregate and dispose of separately TSCA from non-TSCA soil (i.e., soil conservatively determined to be < 50 ppm), where it can be segregated?
  - Soils 0 – 7 ft bgs (i.e., soils above the level of the CMP source elevation)
  - Soils below the deepest documented levels > 50 ppm
- May we consider the soil at ~42 ft bgs (with 1 of 2 sample results > 1 ppm) as dragdown?
- What confirmation sampling will be required to document completion of the Third Modification?

Next Step and Schedule Questions

- What is EPA's schedule for Third Modification text and figure finalization?
- Level of detailed needed in Work Plan for EPA review and approval (as opposed to what JFC and Boeing need for contracting, etc.)?
- What contract-specific detailed documents will EPA need to review and approve (versus EPA just needing to know they exist)?
- What steps during plan implementation will EPA want to formally approve before JFC/Boeing can proceed with the next Plan step?
- What other topics need to be addressed now?


-2 MLLW Tide
~20 gpm leakage from N. wall
7/15/14 14:01